KYMENLAAKSO UNIVERSITY OF APPLIED SCIENCES
Logistics / Logistics and information management

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DEVELOPING THE INFORMATION FLOW OF INBOUND LOGISTICS

Bachelor's Thesis 2011

ABSTRACT

KYMENLAAKSO UNIVERSITY OF APPLIED SCIENCES
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NURMI, SINI — Developing the information flow of inbound logistics
Bachelor's Thesis — 38 pages + 13 pages of appendices
May 2011
Keywords — inbound logistics, information flow, EDI

The production of a manufacturing company is dependent on materials and components arrival on the right time, to the right place and on good condition. To be able to produce their products the company needs its inbound logistics to work on the best possible way. The flow of information is an important part of logistics as an international trade transaction has several parties involved.

This thesis studied the information flow of inbound logistics of the company in question and explored the documentation requirements of the supply chain. The thesis evaluated the possible risks caused by information blocks and developed solution proposals to eliminate the problems. The main objective was to detect how the documentation and information flow should be taken care of to avoid problems during the delivery. The objective was going to be reached by clarifying the overview of the process, identifying the documentation requirements of all parties involved and by developing solution proposals. There had been continual disconnects in the information flow, which was wanted to be eliminated to avoid the risks.

The thesis progressed from organizational statistics, via theory of importing to evaluation of the overall process of inbound logistics. The process evaluation was executed by doing interviews and analyzing the risks. Based on the risk analysis the solution proposals were created.

As a result of the development work four solution proposals to improve the information flow and to prevent the delivery delays were attained. The effects on risk levels of each proposal were evaluated and the proposals were compared with each other. The result gained was a need for further study and an action plan to satisfy the need.

TIIVISTELMÄ

KYMENLAAKSON AMMATTIKORKEAKOULU
Logistiikan koulutusohjelma

NURMI, SINI — Tulologistiikan informaatiovirran kehittäminen
Opinnäytetyö — 38 sivua + 13 liitesivua
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Valmistavan yrityksen tuotanto on riippuvainen materiaalien ja komponenttien saapumisesta oikeaan aikaan, oikeaan paikkaan ja oikeassa kunnossa. Jotta yritys pystyisi valmistamaan tuotettaan, on tulologistiikan toimittava parhaalla mahdollisella tavalla. Tiedon liikkuminen on tärkeä osa logistiikkaa, sillä kansainvälisessä kauppatapahtumassa osapuolia on useita.

Opinnäytetyössä tutkittiin kohdeyrityksen tulologistiikan informaatiovirtaa ja perehdyttiin toimitusketjun dokumentaatiovaatimuksiin. Työssä arvioitiin mahdollisia informaatiokatkosten aiheuttamia riskejä ja kehitettiin ehdotuksia ongelmakohtien ratkaisemiseksi. Tavoitteena oli selvittää, miten dokumentaatio- ja informaatiovirta tulisi hoitaa ongelmien välttämiseksi kuljetuksen aikana. Tavoitteeseen pyrittiin selventämällä prosessin yleiskuvaa, tunnistamalla eri osapuolten dokumentaatiotarpeet ja kehittämällä ratkaisuehdotuksia. Informaatiovirrassa oli huomattu usein toistuvia katkoksia, jotka haluttiin eliminoida riskien välttämiseksi.

Työssä edettiin kohdeyrityksen tuontiliikenteen tilastojen ja maahantuonnin teoreettisen tarkastelun kautta tulologistiikan kokonaisprosessin arviointiin. Prosessin arvioinnissa hyödynnettiin haastatteluja ja riskianalyysiä. Riskianalyysin perusteella etsittiin tilanteeseen soveltuvia ratkaisuehdotuksia.

Kehittämistyön tuloksena saatiin neljä ratkaisuehdotusta, joilla informaation kulkua voitaisiin edistää ja ehkäistä toimitusviiveitä. Työssä arvioitiin ehdotusten vaikutusta riskitasoihin ja ehdotuksia vertailtiin keskenään. Vertailun tuloksena saatiin tietoa jatkotutkimustarpeesta, jonka tyydyttämiseksi laadittiin toimintaehdotus.

TABLE OF CONTENTS:

1 INTRODUCTION

1.1 Introduction to the Bachelor's thesis

The main purpose of profit oriented companies is to offer products or services that fit the customers' needs and to do this as cost effectively as possible. The journey of a product from the company to the end-user may be long and go through many stages, but on the other hand the way to the customer may be quite short, but the components needed for the product may have come a long way. Managing the flow of goods and information during this journey is called the Supply Chain Management (SCM).

Manufacturing companies often play the key role in the chain of companies trying to satisfy the end customers' needs. A manufacturer always has materials coming in and going out, so its operations have an influence on both ways. Manufacturers need raw-materials, components, machines etc. to be able to produce their products and that is – at latest – where logistics management takes place. The bigger the amount of incoming material is the more important the proper flow of information becomes.

This thesis is about the inbound logistics and information flow regarding the incoming shipments of the Company's Helsinki factory that accepts approximately 100 shipments outside the EU-area and thousands of shipments from the EU suppliers every month. More detailed statistical information showing the distribution of supplying countries is presented in figure 2. The focus of this thesis is on the non-EU shipments needing import customs clearance. Global sourcing is the future trend and the Company has low-cost-sourcing as one of its result indicators so the amount of non-EU shipments will grow in the next few years.

The purpose of this thesis is to outline the process of the inbound logistics of the Company, to find out the black spots of information flow during the chain and to create suggestions on how to avoid problems that now occur. The key research question is:

How the documentation and information of imported goods should be taken care of to ensure smooth delivery?

The objective can be divided into three stages:

1. General overview of the process will help to understand the structure of the whole supply chain and to recognize the possible black spots
2. Based on the overall inspection of the process, the information requirements can be identified
3. When the demands are known it is possible to start developing answers for the key research question

That is to say this thesis aims to develop the information flow by creating a way to distribute the information between all the parties involved. If the goal is achieved in the future it would be possible to automate the change of information. This would minimize the risk of delays during the transportation and create a real time channel combining the seller, the buyer and all the actors between them.

1.2 Introduction of the company

The company in question (from now on the Company) is a multi-cultural industrial company developing and producing power and automation technology with leading market positions in its core businesses. The Company was born when two European companies merged in the 1980's. The headquarters are situated in Europe, but the company has about 120 000 employees in around 100 countries. The turnover of the Company worldwide was about 32 billion USD in year 2010. The Company is listed in many international exchanges. (Internal material of the Company)

2 LOGISTICS

The Council of Supply Chain Management Professionals (CSCMP) has defined logistics as "…that part of Supply Chain Management that plans, implements, and controls the efficient, effective forward and reverse flow and storage of goods, services and related information between the point of origin and the point of consumption in order to meet customers' requirements" (Stroh 2002).

2.1 Inbound logistics of the factory

Most of the incoming goods are delivered from the EU-area but because of the subject of the thesis the intra-community deliveries are bypassed. Some statistics are presented in figure 1 to give an idea of the total quantity of received goods. The period of figure 1 starts at the beginning of April. Data for the figures 1-3 have been obtained from the Company's ERP system in December 2010.

Figure 1. Received shipments per month in year 2010

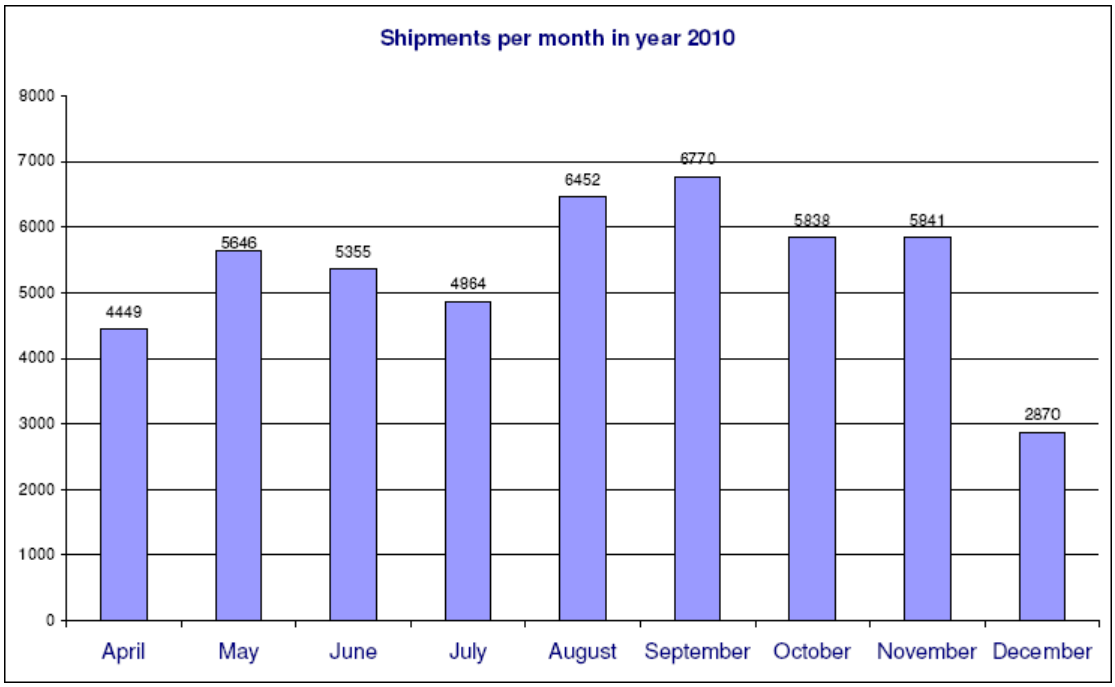


Figure 2 shows how the purchase orders are divided between Finland, other EU countries and non-EU countries. The greatest volume is delivered by native suppliers and only a small percentage, just over 3% of all shipments, by suppliers outside the EU. Although the amount of shipments outside the EU is small, they are the most delicate and therefore require more attention. The information obtained from the ERP-system is not flawless, so in figure 2 there is 0,7 % of the shipments coming from an "unknown" country, meaning that the country code is not entered into the system for the purchase order in question.

Figure 2. Distribution between the supplying areas

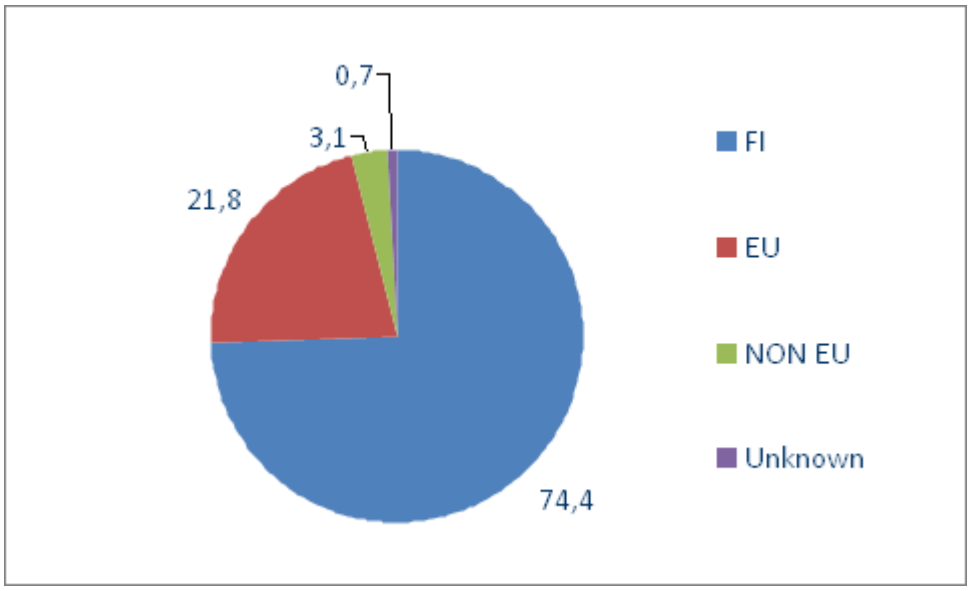
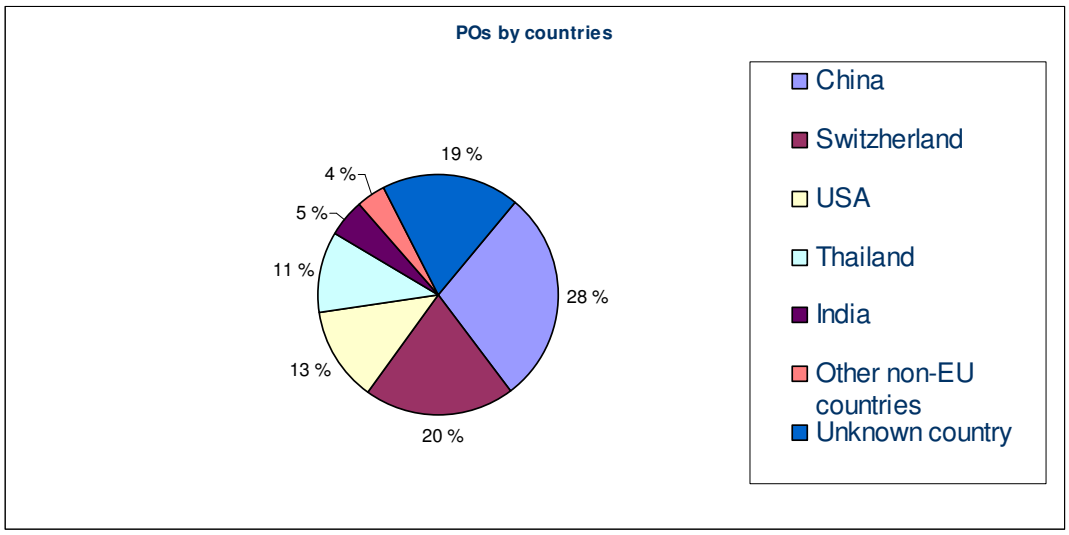


Figure 3. The main focus areas are with the non-EU deliveries



As seen on figure 3 the main supplying countries outside the EU are China, Switzerland, USA, Thailand and India. Because of the nature of the goods and the fact that most of them include iron and are heavy, sea freight is the most commonly used transportation method, except from Switzerland from where the main method is road. Some smaller packages especially from the USA are delivered as air freight.

All service and product providers have been carefully selected by the corporation's supply management so all the offices around the world are using the same subcontractors. This increases the service level of the suppliers as the Company is a

huge customer for most of them and the suppliers are willing to keep the orders coming in. Arranging the transportation on behalf of the buyer is seen as a higher level of customer service. Basically the inbound logistics now flows on its own as assigned forwarding companies and majority of the suppliers are aware of the Company's expectations and are advised to operate in a certain way. Factory's purchasers are advised to work with given delivery terms and some ways of actions have been built up around them during the years of co-operation.

3 CUSTOMS

The customs formalities differ greatly between EU and non-EU countries so the supplier is hardly ever aware of how to streamline the import clearance in the country of destination. If the importing company is not familiar with the possible advantages in import clearance it may pay taxes and duties unnecessarily or face delays as a result of poor documentation. The next chapter describes the import customs clearance policies and aims to point out the documentation requirements. The chapter also introduces the renewals of importing rules and considers if and how they need to be taken into account.

3.1 Import customs clearance

Importing includes paying taxes and duties. The duties are determined by the customs code category the goods are seen to belong. The trade policy uses three means to intervene importing: tariffs, suspensions and import quotas. The trade policies are used to protect domestic producers (tariffs), but also to ensure the sufficiency of raw-materials and products when the demand outreaches the supply (quotas and suspensions).

- Tariffs: A tariff is a tax on imported goods. There are two categories of import taxes: specific tariffs that are calculated as a charge for each unit and ad valorem tariffs that are calculated as a proportion of the commercial value. The tariff rate can be reduced based on the goods' country of origin when importing from particular countries.

- Suspensions: Suspensions can be granted to raw-materials, semi-finished goods or components that are temporarily unavailable in the EU area. When

under a suspension materials can be imported with an exceptional duty rate during the period of validity.

- Quotas: Under a tariff rate quota a lower tariff rate is applied to a given amount of certain imports. This procedure is common especially with agricultural products as domestic production is patronized.

The goods entering the community area are under customs surveillance until they have been presented to customs and their status is changed. Goods are presented to customs by an announcement of specified form. (Hill 2009, Tulli 2011, Suspensions 2011.)

3.2 Renewals of importing rules in 2011

After 1 January 2011 the security data of all shipments crossing the border of the EU must be submitted before entering or leaving the Community Customs territory. The responsibility of submitting this info as an electronic declaration is on transport companies. When the goods arrive in Finland the transporter needs to present the reference number of the security declaration with the goods to the customs. This code is seen as the previous procedure of the customs declaration. The information of the security data notification is used for risk analysis issued by the customs. Security data consists for example of the shipper, the consignee, the transporting company, the data providing company, the transport action, the documentation and the shipment itself. After the information has been provided to the customs a reference number called the MRN-number is generated. The MRN-number is needed for further customs procedures. As the transporter is responsible for this there should be no need for actions from the Company's side **if the documentation is made correctly at the country of origin.** (Tulli 2011, Tullivirkamiesliitto 2011.)

4 INCOTERMS

4.1 Introduction to Incoterms

Incoterms is a collection of delivery terms created by the International Chamber of Commerce (ICC) and its purpose is to facilitate international trade. When mentioned in a sales contract, Incoterms defines the responsibilities and obligations of the parties and reduces the risks of legal complications. In international trade the parties are

infrequently familiar with the other country's habits of trade which can lead to misunderstandings, even to litigation.

Incoterms was created year 1963 by ICC and the collection has been updated about every ten years to keep up with the changing international business world. The most used version now is Incoterms 2000 –release, but it will be little by little replaced with the newest edition of 2010. In the update of the year 1990 the terms were divided into four groups. This was made to clarify the collection and the responsibilities of the two parties.

Table 1. Classification and quick guidance to Incoterms

INCOTERMS 2000 - classification

Group E Departure	**EXW**	Ex Works (...named palce)
Group F Main carriage unpaid	**FCA**	Free Carrier (...named place)
	FAS	Free Alongside Ship (...named port of shipment)
	FOB	Free On Board (...named port of shipment)
Group C Main carriage paid	**CFR**	Cost and Freight (...named port of destination)
	CIF	Cost, Insurance and Freight (...named port of destination)
	CPT	Carriage Paid To (...named place of destination)
	CIP	Carriage and Insurance Paid To (...named place of destination)
Group D Arrival	**DAF**	Delivered At Frontier (...named place)
	DES	Delivered Ex Ship (...named port of destination)
	DEQ	Delivered Ex Quay (...named port of destination)
	DDU	Delivered Duty Unpaid (...named place of destination)
	DDP	Delivered Duty Paid (...named place of destination)

Delivery terms, such as Incoterms, define only the responsibilities and obligations of the seller and the buyer. They does not bind third parties, for example the carriers. It must also be noted that Incoterms does not determine the transfer of the ownership of the goods. They are considered to be the property of the buyer when they are handed over to the first carrier, if not defined otherwise in the sales agreement. (Incoterms 2000.)

Table 2. Transfer of risk in each Incoterm.

		Seller/ Exporter	Export Formalities	Delivery at named place of: Frontier/Terminal/Quay	Loading Port of Shipment	Onboard Ship's Rail	Transport by Air, Rail or Ocean	Onboard Ship's Rail	Discharge at Port of Arrival	Delivery at named place of: Frontier/Terminal/Quay	Import Formalities	Buyer/ Importer
Group E — Departure — The seller makes the goods available at the named place												
EXW Ex Works (...named place)	Carriage		Carriage of the goods from the "named place" is arranged by the BUYER									
	Risks		Risk transfers from SELLER to BUYER when the goods are made available to BUYER at SELLER's "named place"									
	Costs		Costs transfer from SELLER to BUYER when the goods are made available to BUYER at SELLER's "named place"									
Group F — Main Carriage Unpaid — The seller/exporter is only responsible to deliver the goods to a carrier named by the buyer												
FCA Free Carrier (...named place)	Carriage		Main Carriage is arranged	by the BUYER or by the SELLER on behalf of the BUYER								
	Risks		Risk transfers from the SELLER	to the BUYER when the goods have been delivered to the CARRIER at the "named place"								
	Costs		Costs transfer from the SELLER	to the BUYER when the goods have been delivered to the CARRIER at the "named place"								
FAS Free Alongside Ship (...named port of shipment)	Carriage		Main carriage of the goods	is arranged by the BUYER								
	Risks		Risk transfers from the SELLER	to the BUYER when the goods have been placed alongside the ship at the "named port of shipment"								
	Costs		Costs transfer from the SELLER	to the BUYER when the goods have been placed alongside the ship at the "named port of shipment"								
FOB Free On Board (...named port of shipment)	Carriage		Main carriage of the goods	is arranged by the BUYER								
	Risks		Risk transfers from the SELLER	to the BUYER when the goods pass the ship's rail at the "named port of shipment"								
	Costs		Costs transfer from the SELLER	to the BUYER when the goods pass the ship's rail at the "named port of shipment"								
Group C — Main Carriage Paid — The seller contracts and pays for carriage, but is not responsible for costs or risks once the goods have been shipped												
CFR Cost and Freight (named port of destination)	Carriage		Carriage of the goods to the "named port of destination" is arranged by the SELLER				Onward Carriage is arranged by the BUYER					
	Risks		Risk transfers from the SELLER	to the BUYER at the ship's rail at the "named port of shipment" (not destination)								
	Costs		Costs transfer from the SELLER	to the BUYER at the "named port of destination"								
CIF Cost, Insurance and Freight (...named port of destination)	Carriage		Carriage and Insurance to the "named port of destination" is arranged by the SELLER				Onward carriage is arranged by the BUYER					
	Risks		Risk transfers from the SELLER	to the BUYER at the ship's rail at the port of shipment (not destination)								
	Costs		Costs transfer from the SELLER	to the BUYER at the "named port of destination"								
CPT Carriage Paid To (...named place of destination)	Carriage		Carriage of the goods to the "named place of destination" is arranged by the SELLER									
	Risks		Risk transfers from the SELLER	to the BUYER when the goods have been delivered to the (first) CARRIER								
	Costs		Costs transfer from the SELLER to the BUYER at the "named place of destination"									
CIP Carriage and Insurance Paid to (...named place of destination)	Carriage		Carriage and Insurance to the "named place of destination" is arranged by the SELLER									
	Risks		Risk transfers from the SELLER	to the BUYER when the goods have been delivered to the (first) CARRIER								
	Costs		Costs transfer from the SELLER to the BUYER at the "named place of destination"									
Group D — Arrival — The seller is responsible for all costs associated with bringing goods to the "named place or port"												
DAF Delivered At Frontier (...named place)	Carriage		Carriage of the goods to the "named place" at the frontier is arranged by the SELLER									
	Risks		Risk transfers from the SELLER to the BUYER when the goods have been delivered to the "named place" at the frontier									
	Costs		Costs transfer from the SELLER to the BUYER when the goods have been delivered to the "named place" at the frontier									
DES Delivered Ex Ship (...named port of destination)	Carriage		Carriage of the goods to the "named port of destination" is arranged by the SELLER				Onward carriage is arranged by the BUYER					
	Risks		Risk transfers from the SELLER to the BUYER once the goods are made available				to the BUYER on board the ship at the "named port of destination"					
	Costs		Costs transfer from the SELLER to the BUYER once the goods are made available				to the BUYER on board the ship at the "named port of destination"					
DEQ Delivered Ex Quay (...named port of destination)	Carriage		Carriage of the goods to the quay at the "named port of destination" is arranged by the SELLER									
	Risks		Risk transfers from the SELLER to the BUYER once the goods are made available to the BUYER on the quay				at the "named port of destination"					
	Costs		Costs transfer from the SELLER to the BUYER once the goods are made available to the BUYER on the quay				at the "named port of destination"					
DDU Delivered Duty Unpaid (...named place of destination)	Carriage		Carriage of the goods to the "named place of destination" is arranged by the SELLER									
	Risks		Risk transfers from the SELLER to the BUYER once the goods are made available to the BUYER at the "named place of destination"									
	Costs		Costs transfer from the SELLER to the BUYER once the goods are made available to the BUYER at the "named place of destination"									
DDP Delivered Duty Paid (...named place of destination)	Carriage		Carriage of the goods to the "named place of destination" is arranged by the SELLER									
	Risks		Risk transfers from the SELLER to the BUYER once the goods are made available to the BUYER at the "named place of destination"									
	Costs		Costs transfer from the SELLER to the BUYER once the goods are made available to the BUYER at the "named place of destination"									

(Internal material of the Company)

More detailed descriptions of the most commonly used Incoterms in the Company will be presented later in chapter 5.2.

4.2 Overview of the new release, Incoterms 2010

In Räty's (2010) opinion one of the main reasons for the new release of Incoterms 2010 –collection was the increased electrical communication. He also pointed out that the new security level caused by the incidents of the 9/11 has created more restrictions for global trade and pricy inspections have become daily all over the world.

In Incoterms 2010 the number of different terms has been decreased by two and the collection now includes 11 terms. The old terms DAF, DES, DEQ and DDU have been cut off and replaced by DAT (Delivered At Terminal) and DAP (Delivered At Place). Along with these new terms the old DES and DEQ will become unnecessary. Terminal mentioned in DAT-term can be at departure port so it replaces DEQ (Delivered Ex Quay). Likewise, the arriving vehicle in DAP can be a vessel and the defined place can be a destination port, so DAP can be used like DES (Delivered Ex Ship). Both of the new terms are so called "delivered"-terms, which means that the seller is responsible for all costs and risks until the named place, except for possible import customs clearance in the destination country. (Incoterms 2010.)

The Incoterms 2010 is divided to two categories: "rules for any mode or modes of transport" and "rules for sea and inland waterway transport". FAS, FOB, CFR and CIF should be used only for water transport while others are practicable for every mode or combined transport. The last three terms previously included "ships rail" as the point of delivery which has now been changed to "on board". (Incoterms 2010.)

The new release does not replace the 2000 collection immediately. It is still allowed to use Incoterms 2000, but which ever is used it should be clearly mentioned. For example: FOB Helsinki port, Vuosaari; Incoterms 2010. The difference between 2000 and 2010 releases in this case is obvious, as the delivery point has been changed from "ships rail" to "on board".

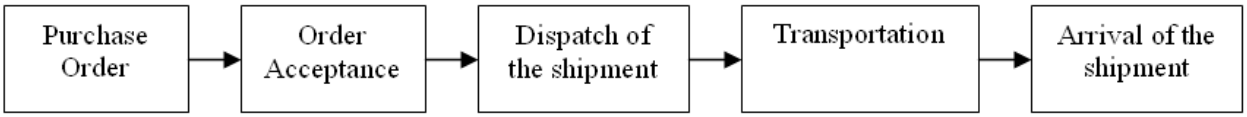
4.3 Incoterms selection at the factory

The Company has no strict guideline to Incoterms selection with third parties. Incoterms are chosen upon making the contract with the suppliers. The Company's supplier managers negotiate with the suppliers and usually the one with favorable freight costs will be responsible for arranging the freight. It the supplier will arrange the delivery the Incoterm is usually DDU if the supplier does not especially prefer some other term. If the Company is in charge FCA or FOB are the most commonly used delivery terms. The purchasers of the Company can make occasional exceptions if for some reason the negotiated term can not be used at the time. (Ojanperä 2011.)

5 THE CURRENT PROCESSES

5.1 Overview of current inbound logistics process

This section describes in greater detail the current process of inbound logistics of the factory starting from placing the purchase order until receiving the goods. The basic idea stays the same in spite of the Incoterm used. The delivery term used determines mostly who is responsible for each point.



Picture 1. Process chart

There are two kinds of purchasing orders used in the factory: orders for stored goods and orders for project materials. For stored goods the orders take place when the minimum limit of goods in the warehouse is reached. For goods needed for a certain project the orders are placed when the product design is ready and the material needs are identified.(Lehtinen 2011, Rieskaniemi 2011.) As the production of the Company is based on make-to-order philosophy, most the incoming goods are for a certain project. The proportion is about 95% of the orders are for project materials and 5% for stored goods. (Ojanperä 2011.) The supplier receives the order and confirms expected readiness of the goods. As mentioned before the Company has partners for every purchase category so there is no need to advice the suppliers if nothing special is required or ways of actions are not modified. The point where the logistics department of the Company becomes interested is when the goods are finished and ready to be shipped. Most of the documentation will be issued at this point and it needs to be correct to ensure trouble-free progress during the whole transportation. The documentation is issued mainly by the shipper, but it should be made to meet the buyer's requirements.

The Company has a few assigned forwarding companies that are advised to act in certain ways and based on that most of the deliveries flow in with no actions needed from the Company.

5.2 Detailed processes by Incoterms

Although the basic process will not change that much with different delivery terms it affects the visibility of each point in the transportation chain. The Company understands the differences between the different Incoterms, but is willing to let the suppliers order the delivery on its behalf. This arrangement can create problems for both parties: if something goes wrong the responsibility and the risk is the buyer's but the supplier might get accused because it was the one ordering the transportation. Especially if the instructions are inadequate the supplier may feel uncertain but – at the same time – powerless if still willing to receive orders from the Company.

5.2.1 FCA

With FCA the buyer is responsible for arranging the delivery from the supplier's facilities. FCA does not differ much from EXW, but EXW is not recommended with non-EU deliveries. FCA is more suitable for deliveries outside the EU because it defines that export clearance must be issued by the shipper. When using FCA the seller arranges the transportation on behalf of the buyer with one of the buyer's assigned transportation partners. Usually the shipper informs the Company's forwarding partner about the shipment and sends over the documents. The Company's logistics team is not necessarily informed about the dispatch at all. When arriving in the destination country the forwarding company usually sends an automatic arrival notice to the buyer and may ask for further details if needed.

5.2.2 FOB

In FOB-cases the seller is responsible for all the costs until the goods are on board (when using Incoterms 2010 collection), including export clearance and Bill of Lading (BL). This means that the seller will deliver the goods to the port and take care of containerization. It is known that FOB should not be used with FCL or LCL shipments, but it has become a way of action with certain suppliers. The seller co-operates with the Company's forwarder who makes the booking for the shipping line and takes care of the delivery up to the delivery address in Finland. From India, China and Thailand the shipper sends the shipping documents by courier to the Company's logistics department that forwards all the necessary papers, such as commercial invoice, original BL, Certificate of Origin (CoO) and other certificates to the

forwarding company in Finland. The documents are needed when the goods arrive at the destination port and need to be presented to the Finnish customs. The import customs clearance will be taken care of by the forwarding company on behalf of the Company.

5.2.3 DDU / DAP & DDP

If D-terms are used it is the responsibility of the seller to arrange the delivery to the named place in destination country. DDU will be replaced with DAP in Incoterms 2010, but the process will stay the same. In D-terms the supplier can use the forwarding company of its choice. The goods are dispatched when they are ready and the agreed delivery date is attained if nothing special is agreed. The first time the buyer is noticed by the forwarding company is when the goods are arriving at the country of destination. At this point the forwarder may ask for instructions, especially with DAP/DDU-term as the buyer will pay the importing duties and the forwarder needs to know if they can channel the costs straight to the consignee's customs credit.

6 PROBLEMS AND DEVELOPMENT NEEDS

6.1 Information needed during the chain

As there are many participants in the demand chain from placing the order up to receiving the goods there are also many documents required by different parties and authorities. The problem with the Company is that nobody is aware of all of these demands, so nobody is able to oversee the deliveries and take care of the information flow. Next chapter aims to clarify the requirements and preferences of documentation during the supply chain and to evaluate the risks.

6.1.1 Order

When placing an order it is important that the delivery term is correct and that both parties are aware of their responsibilities. If roles are not clear it may lead to situations where the goods are finished but nobody arranges the transportation. When operating as described above, the buyer should advice the seller how to take care of the delivery and with what forwarding company. Also all documentation and information requirements should be advised with the order.

6.1.2 Dispatch

At this point most of the shipping related documents should be issued. Even though the shipper is responsible for most of the documentation it should be made according to the consignee's instructions. Many of the documents issued at the country of origin will benefit only at the arrival to the country of destination so the importer should be aware which documents will be needed or will bring advantages when presented. The purchasing and the forwarding departments of the Company are willing to be notified when the goods are to be shipped. With current process some of the suppliers notify the purchasers at dispatch, but the information does not reach the logistics team. That makes it hard to get prepared for the incoming shipments. This is also the point where the documents can still be modified if the deficiencies are spotted. One major issue the importing department of the Company has faced is the lack of customs codes in shippers' documentation. It is the responsibility of the shipper to know and advice the correct customs code of their products.

As mentioned earlier the transporter needs to pre-notice the EU customs of the incoming goods and a security declaration must be done before the goods enter the EU area. This should be taken into consideration at dispatch.

6.1.3 Arrival

Upon arrival most of the documents issued at the country of origin will be needed: Bill of Lading is needed to get the cargo released to the forwarding company from the shipping line, certificates to proof the country of origin and to get reduced duties and the invoice to proof the value of the goods. The logistics team of the Company would like to be notified by the forwarder when the goods are to be imported to take the needed actions. If the notification is not received there is no possibility to advice the forwarding company how to proceed and if something special needs to be taken into consideration. At the arrival point it is also important that the importing team of the Company can have the internal information if some special actions are needed, such as temporary import.

In import customs clearance the following information is required:

- quantity of goods

- description of the goods
- customs value (price of the goods added with freight costs)
- country of shipping
- country of origin
- the customs code (HS-code)
- possible import permission numbers

The import customs clearance must also include the reference number of the international trade, so the customs clearance and the international payment can be identified to belong to the same shipment. The information required by the customs is mostly to be found in the commercial invoice. The commercial invoice must also include:

- the name and address of the seller and the buyer
- invoicing date
- markings, numbers, quantity, types and gross weight of the packages
- trade name and quantity of the goods
- price itemization
- delivery and payment terms

(Pehkonen 1996, Finpro 2010.) But as mentioned before the customs code is often missing. The code is necessary for the customs to be able to place the correct percentage of duties for the imported goods. Most of the goods bought outside the EU-area are within some duty advantage arrangements of the European Union. As a rule of thumb can be said that if the value of imported goods does not exceed 6000€ an affirmation of the producer in the invoice declaring the country of origin is enough,

but with more valuable shipments an official certificate is required. (Suomen Huolintaliikkeiden liitto Ry 2010, 211)

The forwarding company is usually interested in the information needed for the customs so they are able to issue the import customs clearance, but in addition they need the correct delivery address. This has turned out to be surprisingly challenging. The Company receives shipments at the factory and at its warehouse located about 15km from the factory. Both locations have different doors for different profit centers and the goods should be lead to the correct one. At receiving the goods the papers need to include the purchasing order number so the shipment can be inspected and marked as received in good condition and in correct quantity.

After the goods are received an invoice of the delivery will be sent by the forwarding company. If the buyer's reference was not marked in the transportation papers it is hardly in the invoice either. This causes problems as the invoices could be pointed to a certain project if only the PO number was clearly marked but now the costs need to be divided between different departments as general freight costs.

6.2 Document needs

Table 3 shows the different documents that are needed during the chain. On vertical axis is the party that needs the documents and on the horizontal axis is the party providing that document.

Table 3. Required documents by needing and providing parties

Offers: / Needs:	BUYER	FORWARDER	SELLER
BUYER		- dispatch note - BL, etc. - arrival note - customs clearance papers	- order confirmation - covering note / PL - shipping documents - CoO etc.
FORWARDER	- transportation order - forwarding instructions		- shipping documents
SELLER	- order	-BL copy or such	

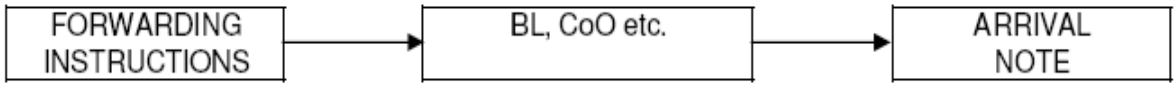
The buyer places an order with the seller, who confirms the order and the expected readiness date. Based on the order and the confirmation the transportation order can be placed to the forwarding company.

Picture 2. Documents of the order stage

When the forwarding company has received the order it begins to arrange the delivery. To be able to arrange all necessary actions at the shipping country the forwarder needs to receive all shipping related documents from the shipper. The buyer wants to have a covering note or packing list sent with dispatch note so it is possible to monitor the ongoing shipments. The dispatch note should include container or Bill of Lading number so the buyer is able to track the shipment during the delivery from the forwarders website.

Picture 3. Documents of the dispatch stage

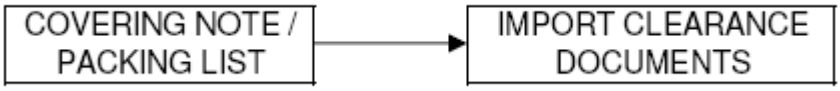
Bill of Lading is finalized when the goods are on board and a copy of it is needed by the buyer (possibly by the seller too). When the goods are about to arrive at the destination country the forwarder needs forwarding instructions (if not provided with transportation order), all documents regarding customs clearance such as certificate of origin and possibly the original BL if used. The buyer needs to be informed of the arrival with arrival note.



Picture 4. Documents of the import stage

The goods can be delivered to the delivery address after they have been presented to the customs. Packing list or covering note with the buyer's reference must be supplied

with the cargo so the buyer can mark the goods as received. The forwarder needs to provide the import customs clearance documents to the buyer for filing.



Picture 5. Documents of the arriving stage

6.3 General view and tracking

There is not a way to do general overview or tracking at the time. Every shipment's arrival needs to be checked manually and may require e-mailing back and forth. Currently the only method to inspect what has come through the logistics team of the Company is to manually update an excel sheet. However that is not reliable because so many shipments are delivered with missing information and the arrival notes may never be sent to the correct persons, which ends up with a sheet with irrelevant information and helps no-one. Purchasing team would naturally like to keep up with the deliveries of their orders. Some suppliers inform when the goods are to be shipped but once again no references (for tracking the delivery) are sent. The purchaser then needs to wait for the goods to arrive at the warehouse and for receipt of delivery updated in the ERP-system.

6.4 Risk analysis

The main concern is that if something goes wrong during the transportation and the goods are not received on time the production may be delayed and the factory will fail to deliver their own products as agreed. As the products of the factory are of high value all the delays are causing considerably high extra costs for the Company as the sales contracts usually include a percentual compensation of the sales price for delays. The production must always be able to run so there is no room for undersupply. The fact that most of the incoming goods are of special design for certain needs, makes on-time-delivery even more important. If the delivery is delayed there is no corresponding product that could be taken from the storage as the components are one of a kind.

The most considerable problem the logistics team is facing, when the suppliers are doing the booking for transportation - even if the delivery term says differently – is that there is a risk of misunderstandings of what transporting company to use, what kind of information is needed, when the goods are needed at the destination, what are the costs and are all the authorities' requirements fulfilled. At the same time it is a huge responsibility to the suppliers to arrange the deliveries at somebody else's risk because if something goes wrong the responsibility is not so clear that it should be.

6.4.1 Main risks and how they may affect

Risk of misunderstandings of what company to use for transportation

If using a transporting company that does not have a contract with the Company the risk increases as the transporter is not familiar with the ways of actions, does not have the correct contact details and the prices have not been negotiated. This may lead into delays in delivery, problems with unloading, mistakes in import customs clearance and uncontrolled transportation costs.

Risk of missing information and poor documentation

When documentation is done poorly and buyer's references are missing there is always a risk that something is missed or some goods are never even received. In situations where goods arrive at the warehouse without correct references the waybill is signed to prove that the delivery has been fulfilled but the goods are not marked to be received in the ERP-system. Missing references may also create situations where nobody is aware of which goods are to be used for which projects. If there are ten similar looking components, but none of them is correctly marked, it is impossible to know where they are supposed to be attached or used. Even if they look the same there may be significant differences and only a specialist of the supplier may be able to tell the difference. This is a serious problem especially as most of the goods are made-to-order.

If the supplier does not provide all the necessary documents the buyer may have to pay more duties than with correct document. As an

example, if the supplier in Slovakia does not include so called Form A to the shipping documents the importing company needs to pay duties that could be avoided with one simple document.

Risk of delivery delays

As the Company is a manufacturer of valuable products which can have very urgent need at the customers facilities there cannot be any idle in production. Part of the purchases is made to satisfy a certain project's material needs and when the production begins all the materials need to be received. In case of delivery delay the consequences may go a long way and in worst cases may halt the customer's production if the Company fails on-time-delivery.

Risk of authority requirements not been fulfilled

Basically goods cannot be imported without fulfilling the requirements of the customs. But the requirements do not end there, as the importing papers, customs decisions and duty invoices must be filed in a certain way. If the filing is failed the customs can impose the Company to pay penalties for each import that is missing the necessary papers.

Risk of high costs

A good example of risks of high costs: one supplier in Canada offered air transportation arranged by them for the price of about 800€, but with the contracts of the Company the costs were just about 100€. If the purchaser did not check this with the logistics department the costs would have been eight times higher. As the Company is a world wide corporation with offices and factories all over the world it naturally has strictly negotiated contracts with much better prices compared to a smaller company with fewer shipments a year.

Risk of confusions of responsibilities

As an example of confusions of responsibilities: a supplier was confused when a purchaser of the Company told them to arrange the transportation with five trailers while they usually had used four for the same amount of goods. The supplier was fairly worried, because if they had ordered five trailers and later the buying company, being the payer of the transportation, had questioned the costs of delivery detecting use of unnecessary equipment, the blame would have been on the supplier. More problems may occur if something goes wrong during the transportation and the goods are delayed or even damaged.

7 IMPROVEMENT PROPOSALS

7.1 Non-electronic solutions

7.1.1 Shipping instruction sheet

One way to try to ensure the documentation requirements are passed to the supplier could be a shipping instructions sheet. The sheet could be in a specified form and sent to the supplier with the order. After the goods are ready the supplier could use the sheet when ordering the transportation from the transporter named by the buyer. Attachment 1 is an example of the sheet. Using this sheet would increase the chance of all the necessary information passed to the forwarding company so they could work according to the requirements of the Company paying for the freight. The sheet would help the supplier and the forwarder to act as the buyer wants but still would not help to create a way to track the purchasing orders on their way to the delivery address. The sheet would only help to send the information to the seller and the forwarder, but not to receive it.

If the sheet would be operated manually, the risk of missing information would be only decreased, not avoided. It is also possible for the supplier to forget to forward the instructions to the transporter. The purchasing department of the Company is not too excited about any extra work so if the sheet could not be obtained from the system it would probably stay unused.

7.1.2 Involvement of the logistics department

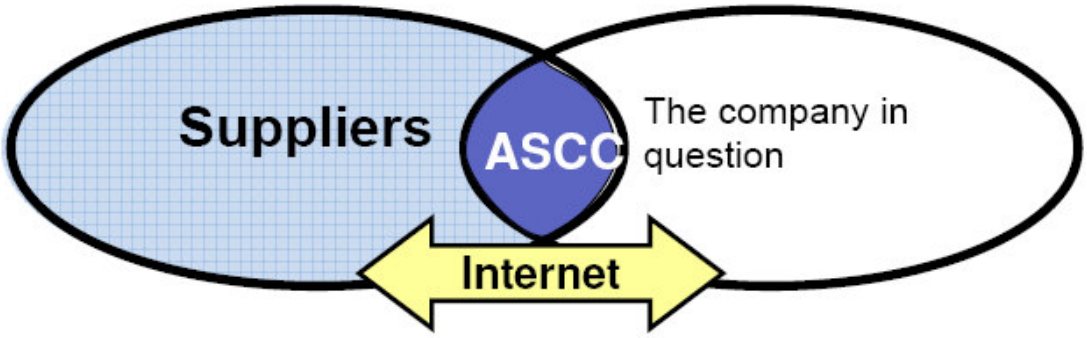
As the amount of non-EU shipments in a month is reasonable it could be possible to involve the logistics team to arrange the deliveries outside the EU. This of course depends on the delivery term in question, so this solution would be most usable with FCA- and FOB-terms, but not impossible with CIF- or DDU-terms either. Compared to the current way of action the visibility and certainty of flawless deliveries would increase when the deliveries would be arranged and handled by the proper party.

Involvement of the logistics department would require more cooperation between the purchasers and the import logistics team. This new way of action should be well planned and agreed with all the parties involved, including the suppliers and the forwarding companies. The actual operations would not change that much, but the party in charge of would be clearer. This way of action would also bring cost advantages when the logistics team could plan the transportations and combine several orders to one shipment. This would naturally require time and effort that would increase the work load of the logistics team, which could lead to the need of more personnel.

7.2 Electronic solutions

7.2.1 Web based tool for document interchange

The Company has an extranet portal where suppliers can view all the purchase orders of different business units of the Company. It is generated on corporation level, but can be modified to meet every business unit's needs. The system has been in use since year 2003 and is used by 80 factories of the Company and by 1000 of its suppliers. With the factory in question the portal is mainly used to exchange purchase orders and confirmations between the buyer and the seller. The purchase order is done in the Company's ERP and automatically sent to the portal. The supplier confirms that the order is received and confirms if the required delivery date can be achieved. Confirmations and changes are automatically sent to the buyer's ERP.



Picture 6. The portal is called the ASCC (Advanced Supply Chain Collaboration) (Internal material of the Company)

Alongside with portal there is another web based system, where the buyer and the seller can exchange documents, for example technical drawings and quality certificates. All the documents sent through this system by the supplier are automatically uploaded to the project folder on the buyer's database.

In the ASCC-portal there are a few additional features that are currently unavailable at the factory. The features that would help to distribute the information needed with the logistics are listed below:

- Transport / Goods Labels: with this feature the supplier could download labels with required references, delivery address and possibly with bar code to be fixed to the packages.
- Shipment Advice: with this feature it is possible for the supplier to create shipping advice to purchase orders and send the information automatically to the database of specified e-mail addresses of the Company

The system is currently restricted to purchasing operations only, but the same methods could be used for logistics operations too. The buyer could easily advice the suppliers by sending shipping instructions through the system and the suppliers could upload BL-copies, certificates, packing lists and other shipping documents and the system would automatically save the documents in electric form to the project file. This way the documents would always be available for the purchasing and the logistics teams of the Company.

Currently the system is used mainly by domestic and EU suppliers, but the extra community suppliers could also easily join the system. The problem is that the system

is meant to be a channel between the seller and the buyer and will not help the communication with the forwarding company. (Internal material of the Company.)

7.2.2 EDI (Electronic Data Interchange)

Already in year 1994 it was clear that improving the information technology was one of the ways to cut back the transportation costs (Auvinen 1994, 7). Clarke (1998) explains Electronic Data Interchange as follows: EDI is the exchange of documents in standardized electronic form, between organizations, in an automated manner, directly from a computer application in one organization to an application in another. The transportation and forwarding business has been one of the pioneers with EDI technology in Finland, so changing information with forwarding partners should be possible with tolerable efforts. Auvinen (1994) and others have also seen the possibilities of EDI in purchasing and inbound logistics. As Auvinen states, with EDI it is possible to cut back mistakes and delays when the basic information is controlled and can be easily and automatically sent to all the parties involved.

Laaksamo & Niemelä (1994, 20) point out the most important possible advantages of using EDI in material operations:

- Delivery time and material cycle: Correct documentation and on-time information flow is at the same time the reason for and the consequence of minimized delivery times.

- Invested capital: Optimizing the storage value has created a situation where the amount of transactions has increased intensively, which creates more information flow.

- Operations' quality: EDI implementation is antedated by inspections and evaluations of current routines and information flow, which helps to eliminate unnecessary phases. Automation of routines ensures that they are done exactly the same way each and every time.

- Flexibility: Serial production usually needs to adapt itself only to seasonal demand variations in production, but with make-to-order production it requires more flexibility.

- Marketing: The points described above are usually directly proportional to the whole supply chain and the company's competitiveness.

- Routine tasks: It is been calculated that it is possible to have 25 parties in an international business transaction. Using EDI to send information between these parties it saves a lot of time and resources when the information does not need to be manually operated. Approximately 7-15 % of companies' turnover is invested to paper handling and filing. With effective EDI system it is possible to cut it by half.

In the Company's inbound logistics EDI could be used to automate the information flow. The most important EDI-transactions would be between the Company and the forwarding company in Finland. After the seller has confirmed the purchase order the ERP system of the Company would automatically send an EDI-message to the forwarder with transport order and forwarding instructions details. When the order is going to be shipped the forwarder would send an automatic message to the buyer with shipping details and later an arrival note with confirmed delivery date. This would give more specific overview of the incoming deliveries as the data could be obtained from the system and printed out to help to estimate the future. Also information of all possible exceptions and delays during the delivery could be sent as an EDI-message between the companies.

The Company's other factory already uses EDI in similar functions so the main technology does exist. There are also other processes in the Company's logistics that could use EDI systems. The software could be also built on the assigned forwarding company's system, but as the Company negotiates new agreements every year it is more reliable to built up a system of the Company's own.

7.3 Risk levels

With the solution proposals it would be possible to decrease the risk level that is currently alarmingly high. Each proposal affects differently on each different risk. In Table 4 the risk levels are evaluated on scale from 1 to 5 (1 being the lowest risk, 5 being the highest). Evaluation is based on experience and assumptions so it can be challenged.

Table 4. The risk level on scale from 1 to 5 with each proposal

	Risk A	Risk B	Risk C	Risk D	Risk E	Risk F
SI-sheet	3	3	2	2	3	2
Logistics team involvement	1	2	2	1	1	1
ASCC	3	3	2	2	3	2
EDI	1	2	2	2	1	1
Currently	5	5	4	2	5	3

Risk A	Risk of misunderstandings of what company to use for transportation
Risk B	Risk of missing information and poor documentation
Risk C	Risk of delivery delays
Risk D	Risk of authority requirements not been fulfilled
Risk E	Risk of high costs
Risk F	Risk of confusions of responsibilities

Risk A would decrease with each proposal, mostly with logistics team's involvement and EDI. In both proposals the transport order would come through the Company's logistics team so the forwarding partner would always be the correct one. SI-sheet and ASCC would decrease the risk a little bit but as they are not handled by the logistics professionals of the Company it is possible to have deficiencies on the shipping instructions.

Risk B can never be totally eliminated, but with logistics team involvement and EDI it could be reduced considerably. If the transport order would be placed by the Company the forwarding company would receive all information and documentation requirements from the correct party. SI-sheet and ASCC would help only to reduce the missing information between the seller and the buyer, but would not include the forwarder.

Delivery delays are not always preventable because all transports are subject to weather conditions, lack of equipments, strikes or other force majeure. Delays caused by usage of wrong transportation company and poor documentation can be reduced with all of the proposals. The risk level is about the same with all of the proposals because even with using any of them most of the delays can not be prevented.

Risk D is not a major one although it is a serious one. The risk level is held down by the authorities as any of imported goods can not be delivered outside the customs area without filling in the customs requirements. The only requirement that increases the risk with every other proposal than logistics team involvement is that all the import customs clearance documents need to be properly filed. When the logistics team is always aware of every shipment coming outside the EU it is possible to control this will be taken care of.

Risk of high costs is strongly connected to risk of misunderstanding of what transporting company to use. If deliveries are always taken care of by the correct partner the costs are negotiated on corporate level, which keeps the costs under control. The risk level is the same with every proposal than it is for risk A.

The risk of confusions of responsibilities is related to the situation where the delivery term is not followed. Incoterms are created to help to clear the transfer of risks and costs of the seller and the buyer, but if the term is not followed it may be difficult to resolve disagreements in cases of conflict. Logistics team involvement and EDI would ensure the delivery term is always followed strictly and reduce the risk. Despite of that there is always of risk of the delivery term is interpreted differently by the two parties.

According to table 4 involving the logistics team would decrease the overall risk level the most, EDI-proposal placing the second. There is no great difference in risk level between those two proposals as the principle is the same in both, only the realization differs. EDI takes automatically care of the things that logistics team could do manually. Neither of these is absolutely reliable, as human work is always vulnerable to mistakes and automated systems may have troubles with connections and are vulnerable to changes in coding.

7.4 Comparing the proposals

All proposals have both positive and negative sides if executed. As described above the proposals answer differently for the risks and therefore the most risk free solutions would be involving the logistics team or executing EDI.

Table 5. Positive and negative sides of each proposal

	+	-
SI-sheet	+ low budget + feasibility + fast implementation + no massive changes on current processes	- time taking in use - dependent on manual use - doesn't eliminate the problem - doesn't help receiving the info
Logistics team involvement	+ increases visibility + obeying Incoterm + control	- workload / time taking - manual work
ASCC	+ system already exists + document exchange + automated filing + used by the whole corporation	- doesn't incorporate forwarders - no development of the process - only partly automated - requires encoding
EDI	+ well-known technology with logistics + fully automated process + comparable functions already exists + a real time system + expandability	- expensive - bureaucracy on corporation level - long implementation project

As mentioned earlier, using SI-sheet does not get much support within the Company's purchasing and logistics teams. It takes a lot of time in use and is susceptible to mistakes and easily forgotten. One problem is that the purchasing team is not the one gaining in but the one suffering from so there is no motivation to put any effort for the SI-sheet. The sheet would not eliminate the actual problem of communication, but would help to provide the information to the seller.

Involving the logistics team could be a suitable solution on short time notice. It is the second quickest solution after SI-sheet and does not require expensive investments right away. Involving the logistics team means involving the Company's logistics professionals and improving the visibility of the whole chain. It also gives the Company more control to handle the possible risks. This solution is however only a quick fix and just gives more time to develop an automated system to reduce the human work needed. When the amount of imported goods keep increasing the amount of work will increase with it, so eventually involving logistics team would lead into recruiting new personnel if no automation is developed.

ASCC and its possibilities to exchange documents would help to cut the gap in documentation between the seller and the buyer. The greatest advantage could be that all shipping related documents would be found on the shared data base of the Company. Without ASCC the logistics team needs to find out who has purchased the incoming shipment and ask for the papers, which may take time – and lead to extra warehousing costs and delays – if the person in question happens to be out of office. ASCC would help and speed up the import customs clearance and delivery as the documents would always be available to the logistics team. The major problem is that ASCC does not involve the forwarding company and therefore is not rated as the best possible solution.

EDI could solve the problems most efficiently and automatically, but requires plenty of time and money for implementation. For the Company the best advantages of EDI would be ensured material income and better control of the process. EDI could also bring cost advantages as many of the routine tasks could be automated and the expensive work time could be used for more productive tasks. The problem is that the logistics partners of the Company are put out to tender every year so there is a risk of EDI-systems would have to be built up with several partners.

8 SUMMARY AND CONCLUSIONS

The theoretical basis for the thesis was gathered from books and publications of well-known logistics professionals as well as using information learned by participating in customs and import seminars. In Chapter 5 current processes were described and evaluated basing on the experience gathered during over six months of investigating the inbound logistics process of the Company and by interviewing purchasers and the logistics manager of the factory. Chapter 6 surveyed the information and documentation needs and the risks were evaluated. Solutions to prevent the risks from occurring were presented in chapter 7 and the proposals were compared with each other to find out the most suitable one.

At the beginning of the thesis the key research question was defined to be: **how the documentation and information of imported goods should be taken care of to ensure smooth delivery** the object being to recognize the black spots in information

chain between all the parties involved and to create a way to prevent the problems from occurring. The objective was divided into three stages, which were fulfilled:

1. General overview of current process and the structure of the supply chain got clearer. The black spots were identified and the risks were evaluated.

2. Information requirements were detected by detail. It became clear what is needed and what information or documentation can bring significant advantages.

3. Solutions for better information flow were created, evaluated and compared with each others.

Two of the solution proposals were seen to satisfy the Company's needs the best: either involving the logistics team or building up an EDI-system. Comparing these proposals taught that logistics team could be involved with fast schedule but in long term planning EDI would bring more advantages. As a conclusion of above can be said that involving the logistics team would be the best solution that could be implemented immediately. It will not eliminate all the problems – it may even create more of them – but will give time to learn more about EDI.

Involving the logistics team is actually mandatory so the process can be evaluated more precisely in practice before the planning of automated system can really begin. As Laaksamo & Niemelä (1994, 22) have stated the processes need to be developed before they can be automated. Even if the process is presented in this thesis on paper it needs more experience of daily operations to make the results more reliable. This thesis has been a great groundwork but further studies are required before the decision of developed system can be placed. The theoretical basis now exists, but combining it with practical experience, extensive co-operation and goal-oriented planning will create the best possible solution that helps all the parties involved.

Next step of developing the information flow of inbound logistics of the Company could be making a pilot study with a couple of high volume suppliers in co-operation with the forwarding partner of the Company's choice. The pilot study would help to receive more daily experience and to develop the process. In the pilot study all the parties from different countries and with different point of views would get a chance

to express their opinions and give suggestions on how things could be taken care of to satisfy all their needs. That way the Company would also receive external experience and could learn how things are handled elsewhere. After the process is examined and developed to meet the advantages of EDI it would be reasonable to investigate the EDI-systems that already exist in the Company. The Company's other factory has an EDI-system in use with its outbound logistics: as the goods are ready for delivery the factory's ERP sends an automatic message to the trucking company with transportation order and all the necessary information. The trucking company will combine all the shipments and pick them up once or twice a day. From the factory's side the process is very simple. It requires a minimum amount of paper work but ensures that all is done according to its requirements. The same system is going to be introduced to the Company's all factories in Finland. The development working group is going to begin the project on year 2011. As the author of this thesis is participating in the development team it would be possible to incorporate the inbound logistics point of view on the same project.

The most challenging feature in the project of developing the information flow is the differing authority requirements in different countries and the fact that an international business transaction can involve dozens of people in dozens of companies and organizations. It is demanding to try to find a solution that is accepted by all parties and that everyone is willing to make an effort to advance the ways of actions for common good.

One of the potential forwarding partners has already expressed their interest for co-operation project regarding this subject and the Company has defined the subject as one of the development aims of next year. Developing this subject also supports the objective set by the corporation to reduce the freight costs by about 10 % in the year-to-date. So it can be said that the subject is current and the Company is willing to pay attention to it.

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Appendix 1: SI-sheet

Buyer's Project number and purchase no Seller's Project number and Sales order no Factory serial number(s) Delivery reference		
Description of goods Customs code		
Number of packages Measurements per one package Package type Expected readiness (date)	pcs Lenght x Widht x Height Gross/net weight	
Seller (name, address...) Seller's contact person		
Buyer's Logistician Buyer's Purchaser		
Consignee (name, address...) Consignee contact details		
Notify party (for BL) Notify contact details		
Delivery address Delivery contact details		
Freight forwarder		
	Forwarder at departure country:	Forwarder in Finland:
Delivery term:		
Shipment by		
Freight paid by		
Port of Discharge		
Final Destination		
Container information		
Import VAT paid by		
Import duty paid by		
Shipping marks		
BL instructions	☐ Original Bill of Lading ☐ Waybill ☐ Telex or surrendered ☐ Other:	
Document requirements	☐ Detailed Packing list ☐ Proforma Invoice ☐ Form A ☐ User Manual in English ☐ Other:	
Other comments	All "shipping marks" must be visual in the packing, but as well written in the delivery note, invoice, packing list, waybill and delivery confirmation documents.	

Appendix 2

SUOMENKIELINEN TIIVISTELMÄ

Esittely

Voittoa tavoittelevien yritysten päätehtävä on tuottaa tuotteita ja/tai palveluita, jotka vastaavat asiakkaiden tarpeita, ja tehdä tämä mahdollisimman kustannustehokkaasti. Tuotteen matka valmistajalta kuluttajalle voi olla hyvinkin pitkä ja vaatia monia eri vaiheita tai toisaalta tuotteen valmistukseen tarvitut osat ja raaka-aineet ovat saattaneet kulkea pitkän tien. Tuotteiden ja raaka-aineiden sekä informaatiovirran hallitsemista tämän ketjun aikana kutsutaan nimellä Supply Chain Management (SCM) eli toimitusketjun hallinta. Valmistavilla yrityksillä on paljon sekä sisään tulevaa että ulos lähtevää liikennettä, joten niiden toiminnot vaikuttavat molempiin suuntiin. Mitä suurempi on liikkuvien tavaroiden määrä, sitä tärkeämpää on informaation kulku.

Tässä insinöörityössä käsitellään kohdeyrityksen yhden tehtaan tulologistiikkaa ja siihen liittyvää tiedonkulkua. Sisään tulevia lähetyksiä tehdas vastaanottaa kuukaudessa noin 100 EU:n ulkopuolelta ja EU:n sisäisesti useita tuhansia. Pääpaino on EU:n ulkopuolelta tulevissa lähetyksissä, sillä vaikka niiden määrä on huomattavasti vähäisempi, vaativat ne merkittävästi enemmän huomiota kuljetusjärjestelyineen ja tullauksineen. Työn tarkoituksena on määrittää tulologistiikan prosessit, löytää ongelmakohdat sekä kehittää ratkaisuehdotuksia poistamaan nykyisiä ongelmia. Varsinainen tutkimuskysymys on:

Miten maahan tuotavien tuotteiden dokumentaatio ja informaatio tulisi hoitaa, jotta varmistettaisiin sujuvat toimitukset?

Kysymys voidaan jakaa kolmeen tasoon:

1. Yleisnäkemys prosesseista auttaa ymmärtämään tulologistiikan rakennetta ja koko ketjua sekä tunnistamaan ongelmakohdat.
2. Eri toimijoiden vaatimukset ja toiveet voidaan tunnistaa.
3. Kun vaatimukset ovat tiedossa, on mahdollista alkaa kehittää ratkaisuvaihtoehtoja.

Insinöörityössä siis tähdätään parantamaan informaatiovirran kulkua kehittämällä keinoja jakaa tietoa kaikkien osapuolten välillä. Mikäli tavoite saavutetaan, tulevaisuudessa tiedonsiirto voitaisiin hoitaa automatisoidusti, mikä minimoisi kuljetusviivästys-

riskit ja loisi reaaliaikaisen kanavan myyjän, ostajan ja kaikkien heidän välillään olevien toimijoiden käyttöön.

Logistiikka

Kaiken kaikkiaan kohdeyrityksen tehtaalle saapuu tavarantoimituksia noin 4500 – 7000 kuukaudessa. Suurin osa toimituksista saapuu EU:n rajojen sisäpuolelta, mutta nämä toimitukset jätetään tässä insinöörityössä vähemmälle huomiolle. Vain hieman yli 3 % toimitetaan EU:n ulkopuolelta. Volyymimaat EU:n ulkopuolella ovat Kiina, Sveitsi, USA, Thaimaa ja Intia. Monet tehtaalle toimitettavat komponentit sisältävät rautaa, joten ne soveltuvat painonsa vuoksi parhaiten merirahdiksi. Sveitsistä käytetyin kuljetusmuoto on maakuljetus, ja joitakin tuotteita etenkin USA:sta toimitetaan yleensä lentorahtina.

Kohdeyritys kuuluu maailmanlaajuiseen konserniin, joten lähes kaikki sen alihankkijat ja tavarantoimittajat on kilpailutettu ja valittu globaalisti. Näin ollen kaikki konsernin tehtaat ja toimistot käyttävät samoja toimittajia, mikä lisää palvelun laatua, sillä kohdeyritys on monelle toimittajalle yksi suurimmista asiakkaista. Yritys edellyttääkin, että sen toimittajat järjestävät tilaamiensa tuotteiden kuljetuksen käyttäen kohdeyrityksen valitsemaa kuljetusliikettä. Tämä nähdään lisäpalvelutasona suuren ostovolyymin vuoksi. Monet toimittajat ovat hyväksyneet järjestelyn, ja kohdeyritys luottaa tavarantoimittajiensa ja kuljetusliikkeidensä yhteistyöhön.

Tulli

Tullimuodollisuudet eroavat paljon eri maiden kesken, etenkin jos verrataan EU-maita ja EU:n ulkopuolisia maita keskenään. Näin ollen tavarantoimittaja on tuskin koskaan tietoinen kohdemaan tullin vaatimuksista, joten maahantuojan kannattaisi ottaa huolellisesti selvää tuontitullaukseen liittyvistä asioista. Dokumenttien puuttuminen saattaa aiheuttaa turhaan maksettuja tuontitulleja tai viivästyksiä luovutuksessa. Tuontitullaukseen kuuluu arvonlisäverojen ja tullien maksaminen. Näiden määrä riippuu tuotavasta tavarasta ja siitä, onko sille voimassa mitään erityiskohtelua. Erityiskohteluilla halutaan suojella kotimaisia tuottajia, mutta myös taata tuotteiden ja raaka-aineiden saatavuus silloinkin, kun kysyntä ylittää tarjonnan. Vuoden 2011 alusta lähtien EU:n rajan ylittävien tuotteiden osalta on pitänyt antaa tullille määrämuotoinen

turvatietoilmoitus ennen tavaran saapumista ja poistumista. Turvatietojen antaminen on kuljetusliikkeen vastuulla, joten kohdeyritykselle tästä ei koidu ylimääräisiä järjestelyjä, mutta dokumentaation oikeellisuuden merkitys kasvaa entisestään.

Incoterms -toimitusehtolausekkeet

Incoterms on Kansainvälisen Kauppakamarin kehittämä toimitusehtolausekekokoelma, jonka tarkoitus on helpottaa kansainvälistä kauppaa. Incoterms määrittää kauppatapahtuman osapuolten väliset vastuut ja velvollisuudet, mikä vähentää oikeudellisten ristiriitojen riskiä. Ensimmäinen Incoterms-kokoelma kirjoitettiin vuonna 1963, mutta kokoelmaa on päivitetty noin kymmenen vuoden välein vastaamaan muuttuneisiin tarpeisiin. Uusin versio – Incoterms 2010 - astui voimaan vuoden 2011 alusta alkaen, mutta sen rinnalla voidaan käyttää myös aiempaa 2000-versiota. Vuoden 2000 toimitusehtokokoelma on esitetty taulukossa 1.

Taulukko 1. Incoterms 2000

INCOTERMS 2000 - classification

Group E Departure	**EXW**	Ex Works (...named palce)
Group F Main carriage unpaid	**FCA**	Free Carrier (...named place)
	FAS	Free Alongside Ship (...named port of shipment)
	FOB	Free On Board (...named port of shipment)
Group C Main carriage paid	**CFR**	Cost and Freight (...named port of destination)
	CIF	Cost, Insurance and Freight (...named port of destination)
	CPT	Carriage Paid To (...named place of destination)
	CIP	Carriage and Insurance Paid To (...named place of destination)
Group D Arrival	**DAF**	Delivered At Frontier (...named place)
	DES	Delivered Ex Ship (...named port of destination)
	DEQ	Delivered Ex Quay (...named port of destination)
	DDU	Delivered Duty Unpaid (...named place of destination)
	DDP	Delivered Duty Paid (...named place of destination)

Prosessikuvaus

Kohdeyrityksen tilauskanta koostuu varastomateriaalin tilauksista sekä tilauksista, jotka on tehty yksittäisen projektin tarpeille. Tilaus lähetetään tavarantoimittajalle, joka puolestaan vahvistaa saaneensa tilauksen ja antaa arvion valmistumispäivästä. Tavaran valmistaja tekee usein suurimman osan dokumentaatiosta, mutta olisi tärkeää ottaa huomioon myös vastaanottajan toiveet ja vaatimukset. Kohdeyrityksen nykyisessä prosessissa tavarantoimittaja tilaa tavaroiden kuljetuksen riippumatta siitä, olisiko se tavarantoimittajan vastuulla toimitusehdon mukaan vai ei. Tästä saattaa koitua ongelmia, mikäli jokin epäonnistuu kuljetuksen aikana, sillä vaikka vastuu on tavaran ostajalla, myyjä on tilannut kuljetuksen.

FCA:ta käytettäessä ostajan tulisi järjestää kuljetus, mutta kohdeyrityksen toimituksissa tämän tekee usein tavarantoimittaja. Myyjä ottaa tavaran valmistuttua yhteyttä kohdeyrityksen määrittämään kuljetusliikkeeseen ja sopii tavaran noudosta sekä kuljetuksesta toimitusosoitteeseen asti. Kohdeyritys harvoin saa tästä minkäänlaista ilmoitusta vielä lähtövaiheessa, joten puutteelliseen dokumentaatioon tai järjestelyihin on mahdotonta päästä vaikuttamaan.

FOB-ehdossa myyjä vastaa tavarasta ja kuluista, kunnes tavara on siirretty laivaan. Prosessi vastaa hyvin pitkälle FCA:n prosessia, mutta kulut ja vastuu siirtyvät ostajalle hieman myöhemmin.

DDU- / DAP- ja DDP-ehdoilla toimittaessa myyjä on vastuussa kuljetuksesta yleensä toimitusosoitteeseen asti, mahdollisesti myös tuontitullauksesta. Myyjä voi käyttää kuljetukseen haluamaansa kuljetusliikettä, jolloin dokumentaatioon liittyvä riski on ostajan kannalta suurempi kuin toimittaessa tuttujen yritysten kanssa. Myyjän valitsema kuljetusliike ei välttämättä ole tietoinen ostajan vaatimista käytännöistä, eikä sillä aina ole ajankohtaisia yhteystietoja hallussaan.

Ongelmat ja kehitystarpeet

Suurin maahantuontiin liittyvä ongelma kohdeyrityksessä lienee siinä, ettei yrityksessä ole ketään, joka olisi tietoinen koko toimitusketjun ja sen osapuolten vaatimuksista, pystyisi valvomaan toimituksia kokonaisvaltaisesti ja pitämään huolen informaatiovirran toimivuudesta. Nyt jokaisen tilauksen saapuminen täytyy tarkastaa manuaalisesti ja epäselvyyksien selvittely vaatii sähköpostien lähettelyä edestakaisin.

Ostotilauksen yhteydessä olisi tärkeää, että molemmat osapuolet olisivat selvillä toimitusehdosta ja vastuiden jakautumisesta. Ostajan tulisi osata myös neuvoa dokumentaatioon liittyvissä asioissa. Suurimman osan dokumentaatiosta laatii myyjä, ennen kuin tavara lähtee maasta, mutta monet näistä dokumenteista tulevat käyttöön vasta tavaran saapuessa määrämaahan, joten ostajan vaatimuksilla ja viitteillä on suuri merkitys. Tuontitullauksessa tarvittava tavaran tullikoodi puuttuu usein lähetyksen papereista, mikä aiheuttaa turhaa viivästystä. Oikean tullikoodin osoittaminen on myyjän vastuulla. Maahantuonnin yhteydessä tarvitaan mm. konossementti tavaran vapauttamiseksi varustamolta, kauppalasku ja alkuperätodistukset tullaukseen. Vastaanottajalle on tärkeää, että tavara toimitetaan suoraan oikeaan osoitteeseen ja että tarvittavat viitteet on merkitty. Viitteiden pitäisi olla merkitty myös rahti- ja huolintalaskuihin, jotta kulut voidaan kohdistaa oikein.

Jos kuljetuksen aikana tapahtuu viivästymisiä ja tavarat eivät saavu tehtaalle ajoissa, on vaarana, että tehdas ei onnistu toimittamaan omaa tuotettaan ajallaan. Tehtaan valmistamat tuotteet ovat arvokkaita ja viivästyksistä aiheutuvat kulut huomattavia. Tuotannossa ei suvaita katkoksia, joten komponenttivajauksille ei ole sijaa. Tehtaan tuotanto on täysin tilausohjautuvaa ja osat on tilattu projektien tarpeiden mukaan, joten korvaavia komponentteja ei löydy varastosta. Suurimmat riskit logistiikkatiimin näkökulmasta ovat seuraavat:

- Väärän kuljetusliikkeen käyttö: Aiheuttaa virheitä ja ylimääräisiä kuluja, kun käytetään sopimusten ulkopuolisia toimijoita.
- Puuttuvat dokumentit ja informaatio: Tavarat vastaanotetaan rahtikirjan tai pakkauslistan merkintöjen perusteella, joten on tärkeää, että viitteet ovat oikein. Viitteiden perusteella eri komponentit ohjataan myös lopputuotteille, sillä muuta tunnistetietoa ei välttämättä ole saatavilla. Puuttuvat dokumentit saattavat aiheuttaa tullausviiveitä tai turhia tullauskuluja.
- Kuljetusviiveet: Lopputuotteet ovat asiakkaille usein hyvin kriittisiä, ja heidän toimintansa saattaa olla suunniteltu ajallaan saapuvan tuotteen varaan. Viivästykset vaikuttavat negatiivisesti yrityksen maineeseen ja saattavat karsia uusia tilauksia.
- Viranomaismääräysten laiminlyönti: Tulli edellyttää maahantuojilta tullauksen lisäksi myös dokumenttien asianmukaista arkistointia, mikä ei onnistu, jos osapuolet eivät ole tästä tietoisia. Mikäli arkisoinnissa havaitaan puutteita, tulli

saattaa määrätä yrityksen maksamaan sakkoja jokaisen puuttuvan dokumentin osalta.

- Kustannukset: Kustannukset eivät ole hallinnassa, jos prosessi ei ole hallinnassa. Yrityksen ja sopimuskumppaneiden väliset neuvotellut hinnat ovat usein vain murto-osa siitä, mitä kuljetusliikkeet tarjoavat listahintoinaan.
- Vastuiden jako: Kun vastuut jaetaan toimitusehdon vastaisesti, on riitatilanteessa vaikeaa perustella, kumpi osapuoli on aiheuttanut virheen. Etenkin jos vastakkain ovat iso ja pieni yritys, on isolla yrityksellä valtaa huomattavasti enemmän etenkin välillisesti. Vaikka iso yritys ottaisi vastuun kyseisestä tapahtumasta, saattaa se ohjata tilauksensa jatkossa pienen yrityksen kilpailijalle.

Ratkaisuehdotuksia

- Kuljetusohjeet – lomake

  Yksi keino pyrkiä varmistamaan dokumentaatiovaatimusten täyttyminen voisi olla kuljetusohjelomake. Lomakkeen muotoilu olisi vakio, ja kohdeyritys lähettäisi sen tavarantoimittajalle tilauksen yhteydessä, joka voisi käyttää lomaketta tilatessaan valmiille tuotteille kuljetuksen. Lomakkeen käyttö auttaisi välittämään vaatimukset ja tiedon tavarantoimittajalle ja huolitsijalle, muttei kehittäisi keinoa tiedon vastaanottamiseksi. Lomake olisi ainakin osaksi täytettävä käsin, joten tietojen oikeellisuus olisi täysin täyttäjästä riippuvainen. Hankintaosasto on jo valmiiksi kiireinen, joten manuaalinen lomake ei saa siellä työskenteleviltä juurikaan kannatusta.

- Logistiikkaosaston osallistuminen

  EU:n ulkopuolisten toimitusten määrän ollessa nykyisellä tasolla olisi mahdollista sisällyttää kohdeyrityksen logistiikkatiimi kuljetusjärjestelyihin. Tämä olisi mahdollista lähinnä tilauksissa, joissa on käytetty FCA- tai FOB-ehtoa. Logistiikkatiimin hoitaessa kuljetusjärjestelyt tavarantoimittajan sijaan varmistettaisiin, että tiedot ovat oikein ja kaikki määränpään vaatimukset otetaan huomioon. Samalla saataisiin selkeämpi yleiskuva siitä, missä tilaukset ovat matkalla ja milloin niiden odotetaan saapuvan toimitusosoitteeseen. Tämä ratkaisu vaatisi luonnollisesti aikaa logistiikkatiimiltä sekä tiiviimpää sisäistä yhteistyötä eri osastojen kesken. Samalla saatettaisiin säästää kuljetuskustannuk-

sissa, kun useita eri tilauksia voitaisiin tarpeen mukaan yhdistää yhdeksi kuljetuseräksi.

- ASCC

  ASCC (Advanced Supply Chain Collaboration) on kohdeyrityksen extranet-portaali, jota käytetään pääasiassa hankintatiimin ja tavarantoimittajien väliseen tilausten ja tilausvahvistusten välittämiseen. ASCC:n rinnalla toimii lisäksi dokumenttien lähettämiseen suunniteltu, selainpohjainen järjestelmä, jonka kautta toimittajat lähettävät esimerkiksi tekniset piirustukset ja laatutodistuksen. Järjestelmä tallentaa vastaanotetut dokumentit automaattisesti oikeaan kansioon kohdeyrityksen tietokantaan. ASCC:ssä on olemassa toimintoja, jotka eivät tällä hetkellä ole kohdeyrityksen tämän tehtaan käytössä. Näitä ovat esimerkiksi: kollilaput-toiminto, jonka avulla tavarantoimittaja voi tulostaa pakkauksiin vastaanottajan vaatimusten mukaiset kollilaput, sekä kuljetusohjeistus-toiminto, jonka avulla tavarantoimittaja voi luoda tilauskohtaisia kuljetusohjeistuksia ja lähettää nämä automaattisesti järjestelmään ohjelmoituun tietokantaan tai sähköpostiosoitteeseen. Samaan järjestelmään voitaisiin kohtuullisin muutoksin luoda keinot lähettää ja vastaanottaa laivausdokumentteja sekä muita kansainvälisiin kuljetuksiin liittyviä asiakirjoja. Näin varmistettaisiin asiakirjojen saatavuus ja oikeellisuus. ASCC ei kuitenkaan nykyisellään auta parantamaan tiedonkulkua huolintaliikkeen kanssa.

- EDI

  EDI (Electronic Data Interchange), suomeksi organisaatioiden välinen tiedonsiirto, tarkoittaa organisaatioiden välistä määrämuotoista dokumenttien automatisoitua vaihtoa tietokoneohjelmien välillä. Auvisen (1994) mukaan EDI:n avulla voidaan vähentää virheitä ja viiveitä, kun informaatiovirta on hallittua ja tieto voidaan lähettää automaattisesti kaikille sitä tarvitseville osapuolille. Laaksamo & Niemelä (1994) ovat listanneet EDI:n parhaiksi ominaisuuksiksi esimerkiksi dokumentaation virheettömyyden, oikea-aikaisen tiedonkulun, minimoidut toimitusajat, optimoidun varastoarvon, turhien toimintojen eliminoimisen, toimintojen toistumisen täysin samanlaisina, joustavuuden ja kilpailukyvyn. He lisäävät myös, että EDI:n avulla paperityöhön ja arkistointiin investoitu rahamäärä saataisiin jopa puolitettua. Kohdeyrityksessä tärkeimmät EDI-toiminnot muodostuisivat itse kohdeyrityksen ja valitun suomalaisen huolinta-

liikkeen välille. Tavarantoimittajan vahvistettua tilauksen kohdeyrityksen toiminnanohjausjärjestelmä lähettäisi kuljetustilauksen sisältävän EDI-sanoman huolintaliikkeelle, tavaran valmistuttua ja kuljetuksen alkaessa huolitsija lähettäisi kohdeyritykselle kuljetustiedot sisältävän sanoman ja tavaran saapuessa vielä saapumisilmoituksen. Näin kuljetuksiin saataisiin parempi näkyvyys ja tulevaisuus olisi paremmin ennustettavissa. Kohdeyrityksen toisella tehtaalla EDI on jo käytössä hyvin samankaltaisissa toiminnoissa, joten tekniikka ja osaaminen ovat jo olemassa.

Riskitasot

Ratkaisuehdotusten avulla olisi mahdollista laskea hälyttävän korkeaa riskitasoa. Jokainen ratkaisuehdotus vaikuttaa eri tavalla eri riskeihin. Näitä vaikutuksia on esitelty taulukossa 2, jossa riskitasoja on arvioitu asteikolla yhdestä viiteen. Arviointi perustuu kokemukseen ja olettamuksiin, joten se ei ole tieteellisesti täysin luotettava.

Taulukko 2. Riskitasot asteikolla yhdestä viiteen

	Risk A	Risk B	Risk C	Risk D	Risk E	Risk F
SI-sheet	3	3	2	2	3	2
Logistics team involvement	1	2	2	1	1	1
ASCC	3	3	2	2	3	2
EDI	1	2	2	2	1	1
Currently	5	5	4	2	5	3

Risk A	Risk of misunderstandings of what company to use for transportation
Risk B	Risk of missing information and poor documentation
Risk C	Risk of delivery delays
Risk D	Risk of authority requirements not been fulfilled
Risk E	Risk of high costs
Risk F	Risk of confusions of responsibilities

Riski A olisi parhaiten vältettävissä, jos logistiikkatiimi osallistuisi kuljetusten järjestämiseen tai käytettäisiin EDI-järjestelmää. Tällöin kuljetuksen tilaisi aina oikea osapuoli ja kuljetuskumppani olisi aina oikea.

Puuttuvan informaation ja dokumentaation riskiä pystytään tuskin koskaan täysin eliminoimaan. Riskiä voidaan kuitenkin välttää varmistamalla, että tieto saavuttaa huolintaliikkeen. Parhaiten tähän päästään, kun logistiikkatiimi tai EDI-järjestelmä lähettää kuljetustilauksen.

Kuljetusviiveet johtuvat yleensä muista kuin tässä työssä käsitellyistä osapuolista ja ovat harvoin ennustettavissa. Kaikki ratkaisuehdotukset pienentävät väärästä kuljetuskumppanista ja puutteellisesta dokumentaatiosta aiheutuvaa viiveriskiä, mutta kokonaisriskitaso pysyy samana, mikä johtuu pienestä vaikutusmahdollisuudesta.

Riski D on vakavasti otettava riski, vaikka sen taso onkin matala. Riskiä kontrolloi tulli, joka ei päästä tullaamatonta tavaraa tulos tullialueelta ja näin ollen pitää itse huolen omien vaatimustensa täyttymisestä. Tullin vaatimuksiin kuuluu kuitenkin myös tuontitullausdokumenttien arkistointi, jonka toteutuminen saadaan parhaiten kontrolliin, kun logistiikkatiimi on tietoinen jokaisesta tullattavasta lähetyksestä ja voi valvoa, että kaikki vaadittavat asiakirjat toimitetaan arkistoitavaksi.

Korkeiden kustannusten riski nivoutuu vahvasti yhteen riskin A kanssa, joten parhaiten tätä riskiä pystytään kontrolloimaan kontrolloimalla riskiä A.

Väärinkäsitysten riski realisoituu tilanteissa, joissa on toimittu toimitusehdon vastaisesti ja kuljetus ei ole onnistunut suunnitellusti. Logistiikkatiimin osallistuminen ja EDI-järjestelmä varmistaisivat, että toimitusehto tulee noudatetuksi joka kerta. Väärinymmärrysten riski on silti aina olemassa, sillä Incoterms-kokoelmakaan ei ole aukoton.

Ratkaisuehdotusten vertailu

Kaikilla ratkaisuvaihtoehdoilla on sekä hyvät että huonot puolensa ja ne vaikuttavat riskitasoihin vaihtelevasti.

Taulukko 3. Ratkaisuehdotusten hyvät ja huonot puolet

	+	-
SI-sheet	+ low budget + feasibility + fast implementation + no massive changes on current processes	- time taking in use - dependent on manual use - doesn't eliminate the problem - doesn't help receiving the info
Logistics team involvement	+ increases visibility + obeying Incoterm + control	- workload / time taking - manual work
ASCC	+ system already exists + document exchange + automated filing + used by the whole corporation	- doesn't incorporate forwarders - no development of the process - only partly automated - requires encoding
EDI	+ well-known technology with logistics + fully automated process + comparable functions already exists + a real time system + expandability	- expensive - bureaucracy on corporation level - long implementation project

Kuljetusohjelomakkeen käyttö ei saa juurikaan kannatusta osto- eikä logistiikkaosastoilla, sillä sen käyttö vie paljon aikaa, se on herkkä virheille ja helposti unohdettavissa. Ostotiimillä ei ole motivaatiota lomakkeen käyttöön, sillä heille siitä ei ole suoraa hyötyä. Lomake ei poistaisi varsinaista ongelmaa, mutta auttaisi välittämään tietoa myyjälle.

Logistiikkatiimin osallistuminen olisi toteutettavissa nopeasti eikä se vaadi suuria investointeja. Tiimin asiantuntijoiden osallistuminen lisäisi seurattavuutta kuljetuksen aikana ja kontrollia riskien hallitsemiseksi. Tämä ratkaisuehdotus olisi kuitenkin vain hätäratkaisu, jolla saataisiin lisäaikaa jatkokehittelylle. Tuonnin lisääntyessä myös työmäärä kasvaisi, joten lopulta päädyttäisiin palkkaamaan lisätyövoimaa eikä parantamaan toimintamallia.

ASCC:n käyttö helpottaisi dokumenttien lähetystä myyjän ja ostajan välillä. Logistiikkatiimi saisi automaattisesti tallennetut dokumentit käyttöönsä suoraan verkkolevyltä, eikä tarvittavia dokumentteja tarvitsisi kysellä sähköpostilla eri osapuolilta. ASCC:n suurin puute on se, ettei se sisällytä huolintaliikettä dokumentaatiovaihtoon.

EDI:n käyttöönotto vaatisi paljon aikaa ja rahaa, mutta sen avulla voitaisiin saavuttaa sujuvampi materiaalien sisäänvirtaus ja parempi kontrolli prosessin aikana. EDI toisi myös rahallisia etuja, kun rutiinitehtäviä automatisoitaisiin ja niihin ennen kulunut aika voitaisiin käyttää tuottavampiin tehtäviin. Suurin ongelma EDI:n kanssa on se, että logistiikkakumppanit kilpailutetaan vuosittain, joten systeemi saatettaisiin joutua rakentamaan usean kumppanin kanssa.

Päätelmät

Alussa määritellyn tavoitteen kolme kohtaa saavutettiin:

1 Yleiskäsitys prosessista selkeni, ongelmakohdat tunnistettiin ja riskejä arvioitiin.

2 Tietovaatimukset ja etuuskohtelumahdollisuudet saatiin selville.

3 Ratkaisuehdotuksia kehitettiin, arvioitiin ja vertailtiin.

Ratkaisuehdotuksista kahta pidettiin kohdeyrityksen kannalta tyydyttävimpinä. Näiden ehdotusten vertailussa kävi ilmi, että logistiikkatiimin osallistuminen saataisiin käyntiin nopeasti, mutta pidemmällä aikavälillä EDI-järjestelmä hyödyttäisi yritystä enemmän. Logistiikkatiimin osallistuminen prosessin hoitamiseen ennen EDI-järjestelmän kehittämistä tukee Laaksamon ja Niemelän teoriaa siitä, että prosessia on kehitettävä ennen sen automatisoimista. Prosessiin on tutustuttava käytännön kokemuksen kautta, jotta tuloksien luotettavuus paranisi. Teoreettinen pohja on nyt määritelty. Yhdistämällä se käytännön kokemukseen, kokonaisvaltaiseen yhteistyöhön ja tulokselliseen suunnitteluun voidaan kehittää kaikkia osapuolia hyödyttävä ratkaisu.

Seuraava askel informaatiovirran kehittämisessä voisi olla pilottitutkimus toteutettuna yhteistyössä muutaman suuren toimittajan ja valitun kuljetuskumppanin kanssa. Pilottitutkimus antaisi lisää kokemusta käytännön prosessista sekä mahdollistaisi ulkopuolisen asiantuntijuuden hyödyntämisen. Pilottitutkimuksen jälkeen vuorossa olisi jo olemassa oleviin EDI-järjestelmiin tutustuminen. Kohdeyrityksen toisella tehtaalla on käytössä EDI-järjestelmä, joka tilaa kuljetuksen valmistuneille tuotteille automaattisesti. Prosessi on yritykselle hyvin yksinkertainen, mutta varmistaa, että kuljetustilauksen sisältää kaiken oleellisen tiedon. Sama järjestelmä on tarkoitus ottaa käyttöön kohdeyrityksen kaikilla Suomen tehtailla. Kehitystyöryhmä aloittaa projektin vuonna 2011. Tämän työn kirjoittaja osallistuu työryhmään, joten projektiin voisi sisällyttää myös tulologistiikan näkökulman.

Haastavinta tulologistiikan informaatiovirran kehittämisessä ovat eriävät viranomaisvaatimukset ja prosessiin osallistuvien osapuolten suuri määrä. On haasteellista löytää kaikkia tyydyttävä ratkaisu ja saada kaikki osapuolet osallistumaan ratkaisun kehittämiseen.

Yksi kohdeyrityksen kuljetuskumppaneista on jo ilmaissut mielenkiintonsa aiheeseen liittyvää yhteistyöprojektia kohtaan ja kohdeyritys on määrittänyt aiheen yhdeksi vuoden kehityskohteistaan. Aiheen kehittäminen tukee myös korporaation asettamaa 10 %:n rahtikustannussäästötavoitetta.